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Samane Mehravar, Nicholas Ballard, Amaia Agirre, Radmila Tomovska, José M. Asua

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Relating polymer microstructure to adhesive performance in blends of hybrid polyurethane/acrylic latexes

Samane Mehravar,¹ Nicholas Ballard,¹ Amaia Agirre,¹ Radmila Tomovska,^{1,2} and José M. Asua^{1*}

¹ POLYMAT and Departamento de Química Aplicada, Facultad de Ciencias Químicas, University of the Basque Country UPV/EHU, Joxe Mari Korta zentroa, Tolosa Hiribidea 72, Donostia-San Sebastian 20018, Spain

² IKERBASQUE, Basque Foundation for Science, 48011 Bilbao, Spain

* Corresponding author.

E-mail address: jm.asua@ehu.es (J.M. Asua).

Abstract

The adhesive properties of pressure sensitive adhesives (PSAs) are typically explained on the basis of the molecular weight of the soluble part of the polymer and the gel content. In this work, the potential of using these criteria for fine tuning the performance of PSAs obtained by blending latexes of different characteristics is investigated. It was found that characterization of a PSA in terms of gel fraction and sol molecular weight is an oversimplification and that the whole molecular weight distribution determined by Asymmetric-Flow Field-Flow Fractionation (AsFIFFF) is needed for a meaningful polymer microstructure-adhesive properties relationship.

Keywords: Adhesive properties; polyurethane/acrylic hybrids; AsFIFFF; Microstructure; Blends; miniemulsion photopolymerization

1. Introduction

Pressure-sensitive adhesives (PSAs) are an important class of commercial adhesive used in tapes, automobile trim, note pads, and in a wide variety of other applications [1]. In general, PSAs are soft viscoelastic materials composed of a slightly crosslinked, high-molecular-weight polymer and one or more low-molecular-weight

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